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Two new species of *Leucophora* Robineau-Desvoidy, 1830 (Diptera: Anthomyiidae) from southern Africa

by

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ABSTRACT

Previously, no named species of *Leucophora* was recorded from the Afrotropical Region, although an unidentified South African species was mentioned by Pont & Ackland (1980: 718). In this paper two new species of *Leucophora*, namely *malotiensis* and *subrufitibia*, are described.

INTRODUCTION

About 50 species of *Leucophora* have been described, 29 of these from the Palaearctic Region. Of these 29 species, 7 were recently described from China (Fan 1986, 1988; Feng 1987). Some of these species have a southern Mediterranean distribution (Michelsen & Báez 1985; Ackland 1968). Suwa (1974) recorded 7 species from Japan, all previously described from Europe. In the Nearctic Region about 15 species have been recorded (Huckett 1940, 1965), of which 5 are Holarctic; these species are currently being revised by Dr G. C. D. Griffiths. In the Neotropics about 10 species are recorded (Pont 1974).

The two species described in this paper represent the only material of *Leucophora* that I have seen from the Afrotropical Region, but there are likely to be other undescribed species occurring in Yemen and Ethiopia. The distribution of some of the eastern Mediterranean species found in Israel, could also extend into the Afrotropics.

MATERIALS AND METHODS

This study was based on material in the following museums (acronyms in parentheses):

Natal Museum, Pietermaritzburg (NMSA)
The Natural History Museum, London (BMNH)
Staatliches Museum für Naturkunde in Stuttgart (SMNS)

Morphological terminology is based mainly on McAlpine (1981). Label data of holotypes and paratypes are quoted exactly as they appear; a single slash (/) indicates the end of a line of print. Supplementary information is given in square brackets.

Dissected specimens have their genitalia mounted either in glycerol in plastic vials mounted on the staging pin, or in some cases, where the genitalia have been dissected into smaller fragments, in Canada Balsam on transparent cellulose. Drawings were made with a camera lucida.

The following abbreviations are used:

Thorax: post = postsutural; prst = presutural; acr = acrostichal; dc = dorsocentral; sa = supra-alar; pra = prealar; npl = notopleural.

Legs: f1 = fore femur; f2 = mid femur; f3 = hind femur; t1 = fore tibia; t2 = mid tibia; t3 = hind tibia.

Setae: a = anterior; p = posterior; d = dorsal; v = ventral; ad = anterodorsal; pd = posterodorsal; av = anteroventral; pv = posteroventral.

TAXONOMY

Leucophora Robineau-Desvoidy, 1830

Leucophora Robineau-Desvoidy, 1830: 562. Type-species (Holarctic): *Leucophora cinerea* Robineau-Desvoidy, 1830, designated by Coquillett (1901: 138).

Leucophora is related to *Delia* Robineau-Desvoidy, 1830 and *Eustalomyia* Kowarz, 1873 (Hennig 1967: 111, 1976: LXV). Larvae of *Leucophora* live in the nests of various species of Hymenoptera, feeding on the pollen masses stored by the hosts (Collin 1921: 305, Huckett 1940: 335). *Leucophora* can be recognised by the following combination of character states:

♂ ♀ : Eyes rather small, parafacials and genae wider than width of flagellomere (Figs 14 & 15); eyes in ♀ not much more widely separated on frons than in ♂ ; abdomen robust, cylindrical. Terminalia: ♂ distiphallus rather long, with sclerotized free paraphalli. ♀ : cerci with strong upcurved spines, evidently used for digging during oviposition.

Key to Afrotropical species of *Leucophora* ♂ ♀

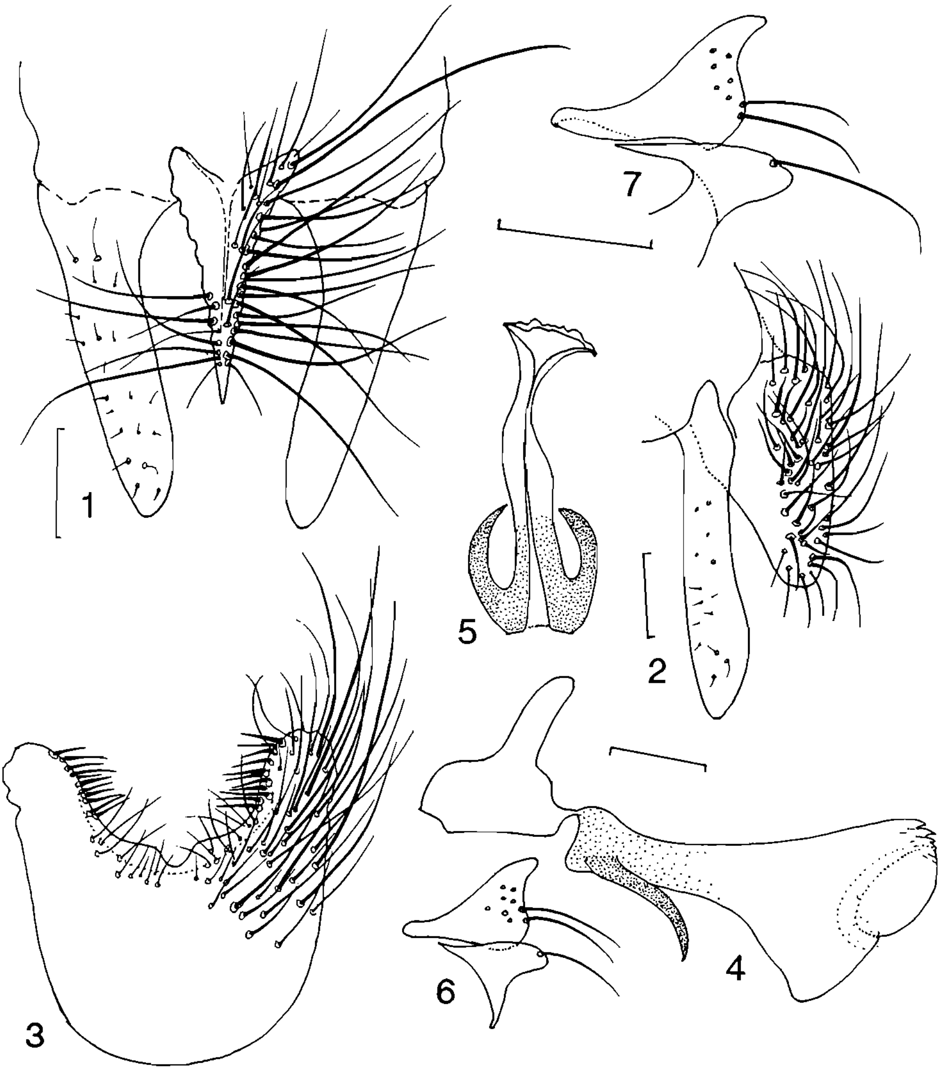
1 Arista with long multi-serial whorls of hairs, total width of hairing 0.8 times width of flagellomere. Cruciate interfrontal setulae present. Lower margin of head curved in profile. Prementum shorter, equal in length to palpi (Fig. 15). Prealar seta as long as posterior notopleural seta. Hind femur with row of pv setae in basal half. Legs completely dark. ♂ : 5th sternite with shorter lateral setae on processes (Fig. 3). Cercal plate pointed apically (Fig. 1). Distiphallus with short paraphalli (Figs 4 & 5) .... **malotiensis** sp. n.

– Arista only pubescent, longest hairs not longer than diameter of base. Cruciate interfrontal setulae absent. Lower margin of head straight in profile. Prementum long and slender, much longer than palpi, subequal in length to fore tibia (Fig. 14). Prealar seta shorter than posterior notopleural seta, about 0.5–0.75 times length of latter. Hind femur with only 2–3 pv setae at apex. Knees and base of mid and hind tibiae obscurely orange-brown. ♂ : 5th sternite with longer lateral setae on processes (Fig. 10). Cercal plate narrowly rounded apically (Fig. 8). Distiphallus with long paraphalli (Figs 11 & 12) .... **subrufitibia** sp. n.

Leucophora malotiensis sp. n.

Figs 1–7, 15

Holotype ♂ : SOUTH AFRICA: 'Bushmans Pass / Maloti Mountains / 2125–2500m / 8–14.Jan.1963'; 'Maseru District / Basutoland / B. & P. Stuckenberg'; 'HOLOTYPE ♂ Leucophora malotiensis / Ackland' [Rectangular red card]; 'Holotype' [circular



Figs 1–7. *Leucophora malotiensis* sp. n., ♂ terminalia (Holotype). 1–2. Cercal plate and surstyli. 1. Caudal view. 2. Lateral view. 3. 5th sternite. 4. Phallus, lateral view. 5. Ditto, ventral view. 6–7. Gonites. Scale lines = 0.1 mm.

card with red perimeter]. Genitalia dissected and mounted in balsam on transparent cellulose pinned below specimen. In NMSA.

Paratypes: SOUTH AFRICA: *Natal*: 1 ♀, Town Bush, Pietermaritzburg, 21.xi.1962, B. & P. Stuckenberg (NMSA); 1 ♀, Natal Nat. Park, Tugela R., 15.iii.1954, F. Zumpt (BMNH). NAMIBIA: 1 ♂, Windhoek Dist., 2218Ca, Auasberge, 21 km S. Windhoek, 31.i.1974, M. E. Irwin, sandy wash in mountains, 1800 m (NMSA).

Etymology: The name *malotiensis* refers to the Maloti Mountains, where the holotype was collected.

Male:

Colour: Head black, with greyish to greyish-green dusting; frontal stripe dark brown to matt black, parafacials and genae viewed from in front densely light grey dusted, parafacials viewed in profile with wide shifting darker grey patch from level of insertion of antennae to level of middle of flagellomere; antennae and palpi black. Thorax black with greyish dust, scutum more brownish grey dusted, a very indistinct brown mid-stripe, major setae arising from brown spots. Scutellum grey dusted as mesonotum. Abdomen, viewed from a low angle behind, with sharply defined dark brown mid-stripe, as wide as hind tibia, viewed obliquely a shifting brown area becomes visible on basal part of tergites. Cercal plate and surstyli orange-brown. Wing membrane and veins orange-brown at base; squamae and fringe orange-yellow as wing base, halteres clear yellow. Legs brown with grey dust, obscurely reddish in places.

Head (Fig. 15): Interfrontal stripe at narrowest place 1.5 times width of anterior ocellus, widening only slightly towards lunule; eyes separated at narrowest part by distance between posterior ocelli; parafrontalia at narrowest place equal to diameter of anterior ocellus; parafacials wide, equal to 1.5 times width of flagellomere; genae below lowest point of eye margin at least twice width of flagellomere; genal setae uniserial, a few short setulae above vibrissa, reaching level of apex of flagellomere; lower margin of head in profile curved from lower occiput to vibrissa; occiput concave on upper part; peristomal margin in lateral view level with lower eye margin; 8–10 frontal setae, upper pair short, level with cruciate interfrontal setulae, which are positioned immediately in front of ocellar triangle. Antennae with flagellomere only 1.3 times length of scape and pedicel combined, arista very short, 1.5 times length of flagellomere, with multiserial whorls of shaggy hairs, width of hairing equal to 0.8 times width of flagellomere. Prementum slender, equal in length to slender palpi.

Thorax: Prosternum bare. Presutural acrostichals distinct, equal to 0.5–0.8 times length of prst dc, rows close together; notopleural depression bare apart from 2 strong setae; prealar seta equal to post npl, but a little finer; 2 proepisternals and 2 proepimerals without associated hairs; scutellum with about 9–11 setulose hairs on each side of disc. Katepisternals 1+2, lower posterior seta 0.75 times length of upper.

Legs: f2 with 2–3 longer av and pv at base; f3 with full row of long av, longest distinctly longer than depth of femur, pv row in basal two-thirds; t2 with 1 ad, 2 pd, all about same length, no av seta; t3 with 2 av, 2 ad, 3 pd, and 2–3 short pv setae.

Wings: Costal spines hardly discernible from other spinules, which are not longer than width of costa. Lower cross-vein oblique and sinuate.

Abdomen: Cylindrical, about as long as head and thorax combined; hind marginal setae on all tergites long and erect laterally, but shorter and more decumbent on mid-line, laterals on 4th tergite nearly as long as width of tergite. Sternites with long erect setae and hairs, including 1st sternite, longest setae equal to three-quarters depth of abdomen. 5th sternite (Fig. 3) with short processes, inner margins with short robust pointed setae on apical half, lateral setae dense but not longer than length of sternite. 6th tergite bare and hidden. Surstyli (Figs 1 & 2) simple, not very long, straight, parallel-sided, in profile even slightly narrower towards base which does not widen at all where it emerges from epandrium. Cercal plate (Fig. 1) in caudal view narrow and pointed, with setae along whole of lateral margins, in profile (Fig. 2) wide, projecting well beyond surstyli. Pregonite (Figs 6 & 7) with single setula; postgonite pointed, with 2 setulae on one side (probably normally 1); distiphallus (Figs 4 & 5) with short basal paraphalli, which are curved downwards and inwards, not quite half length of distiphallus, acrophallus very wide in profile, partly membranous.

Body length 5.5 mm, wing length 5.0 mm.

Female:

Agrees with male except: interfrontalia at narrowest point separated by slightly more than distance between outer margins of posterior ocelli, lower posterior katepisternal seta absent, pulvilli much shorter, ovipositor (not dissected) with some short, stout upcurved spines.

Leucophora subrufitibia sp. n.

Figs 8–13, 14

Holotype ♂ : 'Holotype' [white circular label with red perimeter]; 'STH AFRICA Cape Prov / Kommetjie Hillside / 34188AB 12.ix.1981 / J. Londt, L. Schoeman / and B. Stuckenberg. / Macchia Vegetation' [white rectangular printed label]; 'HOLOTYPE ♂ / Leucophora subrufitibia / Ackland' [rectangular red printed and handwritten label]. In good condition, all appendages present; genitalia mounted in glycerol in plastic tube. In NMSA.

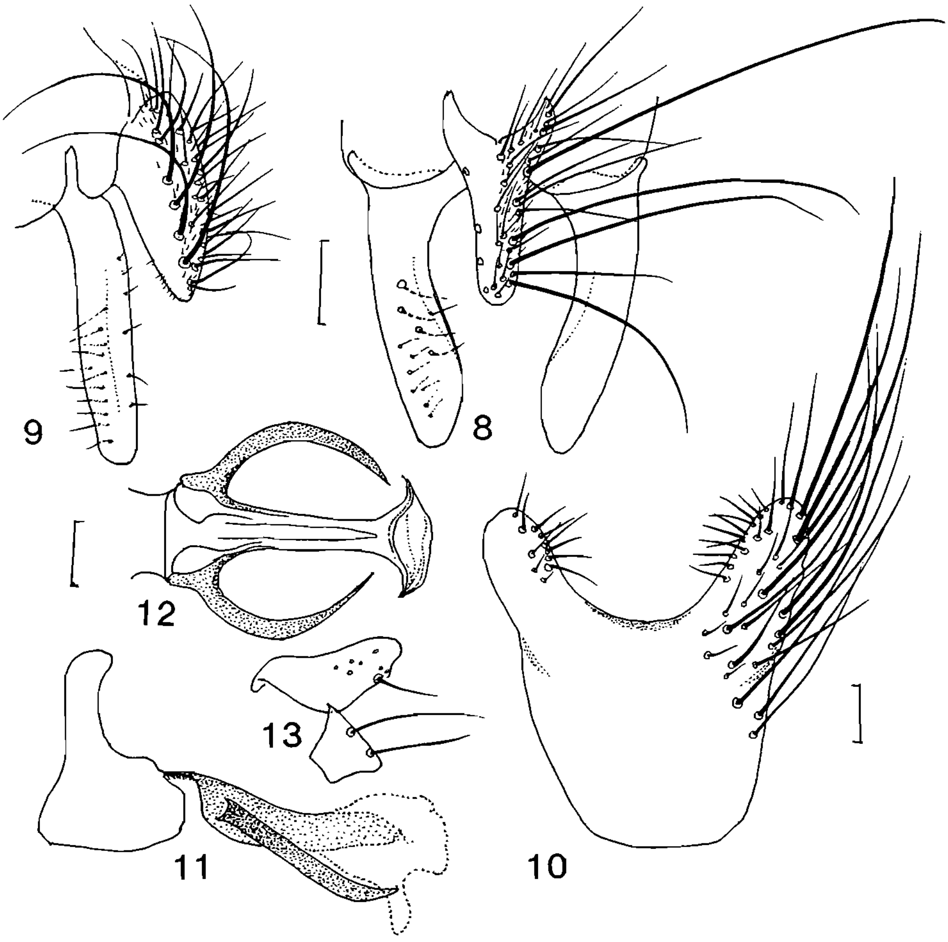
Paratypes: SOUTH AFRICA: *Cape*: 1 ♀ , 8 km E. of Kamieskroom, 3018AA, 5.ix.1983, Londt and Stuckenberg, montane old land with rocks and bushes nearby (NMSA); 1 ♀ , E. Cape, #3, 30 km E. of Rhodes, 30°44'S:28°08'E, 4.ii.1992, Naudesnek summit, 2680 m, Natal Museum Expedition (NMSA); 1 ♂ , Kapstadt, 13.x.–7.xi.1958, E. Lindner (SNMS).

Etymology: The name *subrufitibia* refers to the reddish brown knees and basal part of tibiae.

Male:

Colour: Black with grey dusting, without greenish tinge. Frontal stripe black, parafrontalia black with grey dust, silvery when viewed from in front, adjacent to antennae with darker shifting suffusion which is about as wide as length of antennae. Thorax light grey dusted, without stripes when viewed from any angle. Scutellum grey dusted as mesonotum. Abdomen grey dusted, viewed from behind with a narrow dark median stripe, about equal in width to t3, and dark brown marks laterally on each tergite, these roughly quadrilateral and closer to hind margins; grey dusted areas are shifting and become dark from some angles. Wing membrane light brownish tinged with orange veins, base of wing more orange; squamae whitish with pale fringe, halteres orange. Legs brownish black with grey dusting, except knees and basal part of tibiae reddish orange, especially t2 and t3.

Head (Fig. 14): Parafacials wide, about as wide as half eye width; eyes separated at narrowest part by distance between outer margins of posterior ocelli, frontal stripe here about 2.0 times diameter of anterior ocellus, not much wider towards lunule;



Figs 8–13. *Leucophora subrufitibia* sp. n., ♂ terminalia (Holotype). 8–9. Cercal plate and surstyli. 8. Caudal view. 9. Lateral view. 10. 5th sternite. 11. Phallus, lateral view. 12. Ditto, ventral view. 13. Gonites. Scale lines = 0.1 mm.

genae below lowest point of eye margin slightly less than half eye height; lower margin of head straight, genal setae uniserial, becoming biserial towards vibrissa, peristomal margin in lateral view level with lower eye margin, vibrissal setae close together, i.e. buccal margin viewed from in front not much wider than lunule; 7–8 frontal setae, uppermost pair shorter and at level of apex of ocellar tubercle; no cruciate interfrontal setulae present. Antennae short, flagellomere equal in length to scape and pedicel combined, apex falling short of buccal margin; arista short, length equal to antenna, pubescent, longest hairs not longer than diameter of base. Prementum long and very slender, length from insertion of palpi to apex nearly as long as t1, narrower than t1 and dusted. Palpi very slender, slightly shorter than mentum, apices reaching to middle of mentum, with short setulae.

Thorax: Prosternum bare. Presutural acrostichals biserial, longest pair equal to length of 1st prst dc, interspersed with shorter setulae, no hairs between rows, which are separated from dc rows by 1.5 times distance between acr rows; notopleural depression bare apart from 2 setae. Prealar 0.5–0.75 times length of post npl and finer, placed midway between suture and ia seta; 2 proepisternals and 2 proepimerals of unequal length, no associated hairs; scutellum with a few scattered setulae on disc near margins, marginal setae uniserial. Katepisternals 1+2(3), lower p about 0.8 times length of upper.

Legs: f3 with about 7 ad, about as long as depth of femur, only 1–2 pv at apex; t1 with a median pv; t2 without av, 1 ad, 1 pd, 2 p, the ad and pd short and at same level; t3 with 2–3 av at middle, 2 ad, 3 pd, distal pd longest.

Wings: Costal spines hardly discernible from costal spinules, costa bare ventrally; lower crossvein sinuate.

Abdomen: Cylindrical, tapering in dorsal view. 5th tergite with hind marginal setae as long as length of tergite, posteriorly directed, 6th tergite bare and hidden. 5th sternite (Fig. 10) small, with short lobes, lateral setae long and numerous, the longest as long as sternite. Surstyli (Figs 8 & 9) short, in profile parallel-sided, not wider at base, straight. Cercal plate (Figs 8 & 9) with narrow rounded apex, in profile wide and projecting caudally, setae on margins long, the longest at level of base of surstyli and nearly 1.5 times length of surstyli. Pregonite (Fig. 13) small, with 2 setulae on dorsal margin; postgonite with 1 setula and a rounded base; distiphallus (Figs 11 & 12) with long paraphalli, arising from base, straight in profile with the tips slightly curved dorsally in profile, curved inwards in ventral view and almost reaching apex of acrophallus, which is membranous at apex, in dorsal view narrow but expanded at apex.

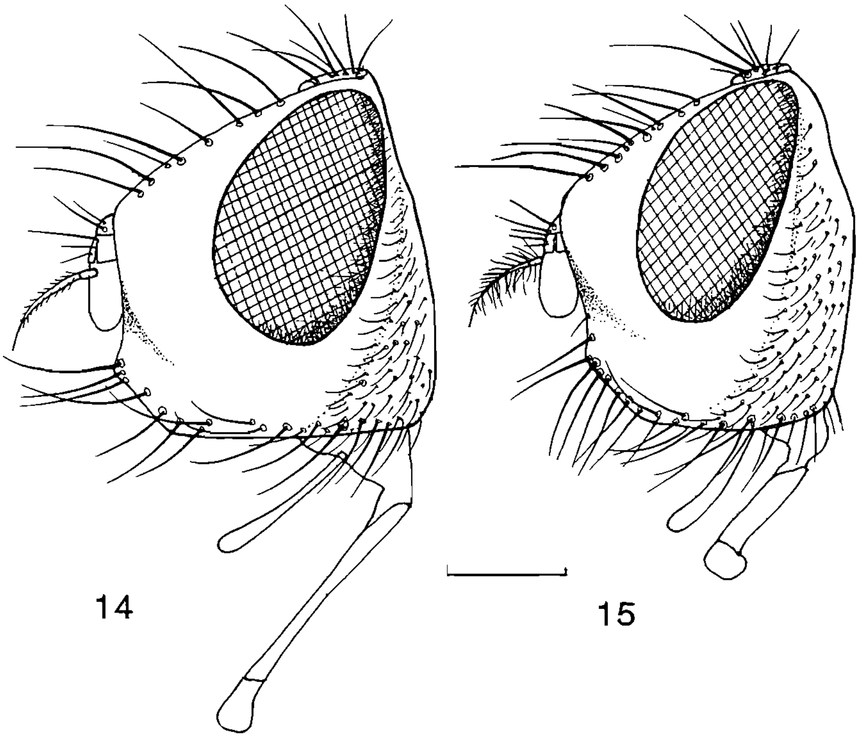
Body length 6.5 mm, wing length 6.5 mm.

Female:

Agrees with the male except: katepisternals 1+1, pulvilli shorter, ovipositor (not dissected) with some short stout upcurved spines.

DISCUSSION

Leucophora malotiensis and *L. subrufitibia* are probably closely related, and form a monophyletic group within *Leucophora*. A male constitutive apomorphy is the strong, narrow paraphalli which arise from the base of the distal section of the aedeagus and immediately diverge from it (Figs 5 & 12). In all the west Palaearctic species the paraphalli either do not diverge, or if they do, they arise from the middle of the distal section. Other possible apomorphic characters possessed by *malotiensis* and *subrufitibia* are: cercal plate long and narrow in caudal view, but strongly projecting caudad in profile (strongly laterally compressed) so that apex and ventral margin of plate is completely visible in profile, strong long lateral setae present right to apex (Figs 2 & 9); surstyli in profile short, narrow and not widened basally; processes of 5th sternite short, not more than half length of basal part of sternite (Figs 3 & 10). Some of these latter character states are found in some Palaearctic species, e.g. *personata* (Collin), *unistriata* (Zett.) and *unilineata* (Zett.), but these species all possess a ventral seta on the mid tibia, and the paraphalli arise from the middle of the distal section of the aedeagus. The length of the aristal hairs, used as a group



Figs 14–15. *Leucophora*, ♂ head, lateral view. 14. *L. subrufitibia* sp. n., paratype, Cape Town. 15. *L. malotiensis* sp. n., holotype. Scale line = 0.5 mm.

character by Collin (1921) and Hennig (1967) is clearly only of specific value, as *malotiensis* has long aristal hairs and in *subrufitibia* the arista is only pubescent. The presence of a ventral mid tibial seta is also of little phylogenetic significance, being absent in the species described here, but present in *personata*.

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